TITLE OF THE INVENTION:

BURNABLE MATERIAL IN THE FORM OF AN IGNITION STRIP

TECHNICAL FIELD OF THE INVENTION

The present invention generally relates to an inflammable or easy burnable, single-service material assembly and with said material assembly more particularly being allotted the form of a lighting strip and even more particularly to such a lighting strip that is adapted to, in a non-compacted state, be able to present, after a lighting, an initial combustion with a generated amount of energy adapted for a primary initial lighting and a subsequent secondary combustion of the lighting strip, for a lighting provided by the same of an adjoining inflammable material, such as pieces of firewood formed from wood.

BACKGROUND OF THE INVENTION

Inflammable, single-service material assemblies are previously known in a plurality of different embodiment examples and are intended to be highly flammable, in order to be able to provide a lighting of an adjoining inflammable material, which in a normal case consists of pieces of firewood or burnable material formed from wood. In many applications, such inflammable material assemblies have got the form of sheets of newspapers, which have been crumpled up to a "ball" or the like, and with the paper material in the sheets of newspapers having

been compacted to such a degree that it will be possible to supply air and oxygen to the material assembly.

There are also previously known different types of paraffin-soaked material assemblies, in order to, in that way, be able to increase the amount of energy or the content of energy beyond what paper materials alone present.

The content in the material assembly shown and disclosed in the patent publication DE-C1-522 478, where a primary material is wound in two turns and is composed of a wood material, belongs to the prior art.

The material assembly is allotted a toothed line or border, in order to, in that way, be able to improve an initial lighting of the material assembly.

Here, the utilisation of two relatively stiff wood members that are allotted toothed edges is taught.

As for an inflammable, single-service material assembly, the subject-matter in the patent publication FR-A1-2 604 721 also belongs to the prior art.

The utilisation of the following also belongs to the prior art:

Lighting paper

The same consists of thin, elongate plates of pressed wood pulp, which have been impregnated with paraffin-like substance. They are placed close to the bottom of the combustion appliance or under charcoal in a grill. The combustion takes place slowly with a yellow, somewhat soot-producing, flame within a zone close to the lighting paper and since the same does not reach out to the log surfaces, the heat does not become intense enough for a rapid lighting sequence.

Fire-lighters

These units are intended for fireplaces, outdoor fires and grills and consist of blocks of wood pulp fibres impregnated with paraffin-like substance. These compact units are impaired by the same limitation that has been stated above, the flames do not reach up close enough to the fuel surfaces, and therefore the lighting up takes longer time. The combustion takes place at a relatively low temperature, and therefore frequently a firing time, stated in an instruction for use, of approx. 15 min must be spent before the fire is completely lighted.

Lighting blocks

These are manufactured from a liquid-absorbing material, which completely or partly has been soaked with paraffin oil-like, strongly petroleum-smelling liquid, which has been encased in a tight plastic bag. Also in this case, the flame is relatively small, yellowish and strongly sooting, and the firing time is also here approx. 15 min.

Paraffin bags

Small sachets containing a paraffin-like substance that upon a lighting burns relatively slow. Thereby, the paraffin successively melts, but the firing time is also here approx. 15 min at a relatively low temperature.

Fuses

The same are provided with an extra powerful matchhead and gives a concentrated seat, which only comprises a small volume.

Lighting fluid

The same frequently consists of a petroleum product, which is cleaned to the extent that it can be used for lighting outdoor grills and outdoor fires as well. However, it is not so much used for indoor use. The disadvantage of such a liquid is the risk of leakage, and frequently it is also impractical to bring in adventurous events outdoor.

Calor gas© heat

Calor gas© has been used on trial upon starting up of single-house boilers, but in that connection certain problems have occurred.

According to a report No. 4669 published by "The National Swedish Environment Protection Board", it has been observed that upon firing in single-house boilers when using wood, large emissions of hydrocarbons and other noxious substances take place, in particular during the lighting-up phase. One of the conclusions is quoted from page 54 in said publication under the heading: "Vedeldade villapannor – resultatet av jämförande utsläppsmätningar" ("Wood-fuelled single-house boilers – the result of comparative measurements of emissions").

"A relatively great part of the total emissions from modern boilers arises during the lighting-up phase. For some of the boilers, excess combustion is used upon start. Generally, the temperature of wood, fire bars and final combustion zone is low in the starting-up phase and therefore more uncombusted hydrocarbons are generated than when the boiler is heated. Hence, there is a need for developing methods of lighting up. For boilers having good combustion as to the rest, a minimization of the length of the starting phase is important for the total emission. It is possible that concentrated supply of energy from outside is required in order to solve this problem".

See also bar chart illustrated in attachment 21.

Tests with a preheating using Calor gas© and electricity have been carried out. This involves a consumption of energy of the type that should be saved. The result is not satisfactory.

SUMMARY OF THE PRESENT INVENTION

TECHNICAL PROBLEM

Considering the circumstance that the technical considerations, which a person skilled in the art of the relevant technical field has to do in order to be able to present a solution of one or more posed technical problems, are, on one hand, initially a necessary understanding of the measures and/or the sequence of measures that have to be executed, and, on the other hand, a necessary choice of the means that is/are required, then, in this connection, the subsequent technical problems would be relevant in bringing forth the present subject matter of the invention.

While taking prior art into consideration, as it has been described above, it should, therefore, be seen as a technical problem to be capable of realising the significance of and the advantages associated with the provision of a lighting strip, manufactured from two or more materials in a certain combination and with a balance between, on one hand, a structural- and stability-providing part, and on the other hand one or more energy-releasing parts.

Hence, it is a technical problem to be capable of realising the significance of and the advantages associated with being able to provide a simple construction, whereby a configuration on the lighting strip is given such embodiments, by

charge, heat sealing, mutually varying relationships between utilised paper and plastic layers with the effect that the tendency and the possibility of a rapid lighting up being increased, the same being possible to be presented by the fact that the exposure surfaces of the lighting strips are increased and/or that measures have been taken for providing a multi-stage effect, by the fact that a more highly flammable part first catches a fire so that the same in turn should light a next layer or part that is burnt at a higher temperature, etc.

Hence, it is a technical problem to be capable of realising the significance of and the advantages associated with being able to provide a simple construction whereby an additional high-energy component or a smoke-generating component can be integrated in the system, in the form of a powder, a granulate, a paste or a liquid, whereby an adaptation of the energy release of the lighting material in the lighting strip can be attained, in view of the field of application and the need in question.

In addition, there is a technical problem to be capable of realising the significance of and the advantages associated with being able to provide the same high-energy material combination that by means of a tight reeling or joint and compact storing can present a high-energy source of heat without explosion hazard and can be contained upon a flashover from outside without fire arising thereby, since only a process of carbonization can start thanks to the air oxygen does not having any free access.

Hence, it is a technical problem to be capable of providing a combination of materials in the lighting strip having environmental-friendly properties, which, in addition to the fact that the lighting strip itself during the combustion emits smallest possible amount of or no noxious substances, functions in such a way upon lighting up of, e.g., wood that smallest possible amount of hydrocarbons or other noxious substances is produced upon the combustion thereof during the starting phase.

Hence, it is a technical problem to be capable of realising the significance of and the advantages associated with being able to provide a simple and practical dispenser construction of the lighting strip or lighting strips so that the strip is tightly, hermetically contained during a storage/distribution, so that it upon the time of use still is completely dry, easy to get out in the intended quantity, which

length may be measured, e.g., in running metres, and that the dispenser immediately after pulling out can be shut off for continued tight storing.

Moreover, there is a technical problem to be capable of creating such conditions that also upon a smaller leakage arose due to an outer damage in the dispenser, the risk of penetration of moisture into the lighting strips can be reduced by the fact that a sachet containing a desiccant is inserted in the dispenser, which desiccant is a moisture-absorbing granulate or powder (e.g., silica gel).

Hence, it is a technical problem to be capable of realising the significance of and the advantages associated with the provision of a roll, reeled by the strip material, which roll for instance may be surrounded by a cardboard or paper unit.

In one embodiment, the centre of the roll consists of a hole, from which the inner end of the lighting strip is extractable towards one of the openings, and in that way the lighting strip can be pulled out easily without getting stuck.

In another embodiment, the roll has been reeled or compressed, so that it has become quadrangular in the periphery and trace a quadrangular cross-section. Then, the same becomes space saving as surrounding packaging has been selected cubic.

Hence, it is a technical problem to be capable of realising the significance of and the advantages associated with allowing said lighting strip, in the form of a strip roll, possibly surrounded by a cardboard or paper casing, to be enclosed by a dispenser, consisting of a plastic film or plastic bag, which in the two ends thereof is tightly sealed around the strip roll, close to one end of the bag a cardboard sheet being attached, in the centre part of which a hole have been made, large enough for a passage of the strip (the free end from the centre of the roll), the hole also having been punched through the wall of the bag. To enable an efficient closing (over-coverage) of the hole having the strip in the centre thereof, in addition a cardboard piece has been arranged, which tightly closes up the hole and is locked in place by stick glue or the like.

Hence, it is a technical problem to be capable of to provide the utilisation of a "bib" or "tab", which is attached across the end closure of the bag close to the strip hole or at another location on the bag, so that the extension of the bib on the same side as the hole reaches out across the same and across the cardboard plate surrounding the hole, so that a tight lid across the hole is formed, which

is locked all around the hole by stick glue that has been applied to the same area.

Hence, it is a technical problem to be capable of realising the significance of and the advantages associated with allowing the lower edge of the "bib" to be provided with a toothed edge line, which enables simple tearing off of the strip.

While taking prior art into consideration, as it has been described above, it should, therefore, be seen as a technical problem to be able to, for an inflammable, single-service material assembly, in the form of a lighting strip, in a non-compacted state adapted to be able to present, after a lighting, an initial combustion with a generated amount of energy adapted for a primary initial lighting and a subsequent secondary combustion of the lighting strip, in order to, in that way, provide a lighting of an adjoining inflammable material, such as pieces of firewood formed from wood, realize the significance of, the advantages associated with and/or the technical measures that are required for creating such conditions that the lighting strip can be formed from a plurality of strips, each of which is thin and, at position intended for storing, allotted the form of a roll having a large number of helical-oriented turns.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing the lighting strip to have, at all events, two thin and slender, elongate and co-ordinated, strips, wound up to a compact helical shape.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing the lighting strip to be structured as and constituting of a thin paper strip and of a thin plastic strip, and that the lighting strip, in an unwound and non-compacted state, can be so co-ordinated with the appurtenant strips thereof that a rapid lighting and a combustion of co-ordinated paper strip and plastic strip will take place.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing said thin plastic strip to be composed of polyethylene (PE).

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing said thin paper strip and said thin plastic strip, via opposite surfaces or surface portions, be completely or partly co-ordinated, such as united to each other.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing the lighting strip to be partly processed in such a way so that thereby, in a non-compacted state of the lighting strip, possibility for air to pass into and in that way get access to a developed seat of fire is presented, for a combustion-enhancing supply of oxygen.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing one or more energy-raising and/or combustion-improving and/or smoke-forming additional substances, such as powder, paste or liquid, to be supplied to said thin paper strip and to said thin plastic strip united to each other in order to form pockets.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing said additional substances to be fixed inside a plurality of formed gaps between one or more thin paper strips and one or more thin plastic strips, by the fact that adjoining and opposite strip-allotted edges are provided with one or more seals.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing said seals to be longitudinally oriented for the formation of a tunnel or a tube from one or more utilised paper strips and one or more utilised plastic strips, alternatively longitudinally and transversally oriented for the formation of closed pockets.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing the paper strip to be allotted an adapted thickness, flexural stiffness and/or resilience, with strip-associated paper fibres oriented and

allotted a capacity to be able to realign elastically somewhat after a crumpling up for the formation of a "ball".

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing the thickness, the flexural stiffness and/or the resilience of the paper strip and co-ordinated plastic strip to be mutually adapted to, with small compression, be able to support one or more pieces of firewood resting against said "ball".

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing the thin plastic strip to consist of an environmental-friendly, high-energy, plastic material, forming carbon dioxide and water during a combustion at a free access of air.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing the material content in and the structure of the paper strip co-ordinated with the material content in and the structure of the plastic strip to be mutually adapted to give a chosen balance between a structural- and stability-providing capacity and an energy- and power-releasing capacity generated during a chosen combustion.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing the paper strip and/or the plastic strip to have an edge configuration adapted for providing an embodiment that gives a tendency to and the possibility of a rapid lighting up.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for providing a combustion allotted a multistage effect, adapted to be attained by the fact that a more highly flammable layer or a part is brought to catch fire initially, and that the same in turn is adapted to allowing to light a second layer or part, adapted to subsequently being burnt at a higher temperature.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations

that are required for allowing a utilised additional substance to be adapted for a selected energy release, directly adapted to a current field of application.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing the two or more co-ordinated paper strips and/or plastic strips of the lighting strip, which strips have the same or different thickness and/or width and/or length, to be so tightly wound up to a roll and so compactly contained that it can resist a lighting by a fire coming from outside.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing a number of said lighting strips formed to a compact helical shape to appear as individual units co-ordinated in a dispenser construction.

Moreover, there is a technical problem to be capable of realize the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing said lighting strip and a set of matches and a striking surface to be packaged as a unit.

It is a technical problem to be capable of realising the significance of, the advantages associated with and/or the technical measures and considerations that are required for allowing the lighting strip and a lighter to be packaged as a unit.

THE SOLUTION

In that connection, the present invention starts out from an inflammable, single-service material assembly in the form of a lighting strip, in a non-compacted state adapted to be able to present, after a lighting, an initial combustion, with a generated amount of energy adapted for a primary initial lighting and a subsequent secondary combustion of the lighting strip, for allowing to provide a lighting of an adjoining inflammable material, such as one or more pieces of firewood formed from wood.

In order to be able to solve one or more of the technical problems mentioned above, the present invention teaches that the lighting strip should, in a position intended for storing, be allotted the form of a roll and should then have,

at all events, two thin slender, elongate and co-ordinated strips, wound up to a compact helical shape, that the lighting strip is structured as and constituting of one or more thin paper strips and of one or more thin plastic strips, and that the lighting strip, in an unwound and non-compacted state, is so co-ordinated with the appurtenant strips thereof that a rapid lighting and a combustion of utilised paper strip and utilised plastic strip will take place.

As proposed embodiments, coming within the scope of the basic idea of the present invention, it is taught that said thin plastic strip, alternatively plastic strips, should be composed of polyethylene.

Furthermore, it is taught that said thin paper strip and said thin plastic strip should be completely or partly united to each other via opposite surfaces.

Furthermore, it is taught that the lighting strip should be partly processed in such a way so that thereby, in a non-compacted state of the lighting strip, the possibility for air to pass and in that way get access to a developed seat of fire is presented, for a combustion-enhancing supply of oxygen.

Furthermore, it is taught that one or more energy-raising and/or combustion-improving additional substances, such as powder, paste or liquid, are supplied to said thin paper strip and said thin plastic strip.

Furthermore, it is taught that said additional substances should be able to be fixed inside a formed gap between said thin paper strip and said thin plastic strip, by the fact that adjoining and opposite strip-allotted edges are provided with one or more seals.

Furthermore, it is taught that said seals should be able to be longitudinally oriented for the formation of a tunnel or a tube of utilised paper strip and utilised plastic strip, alternatively longitudinally and transversally oriented for the formation of closed pockets.

Furthermore, it is taught that the paper strip should be allotted an adapted thickness, flexural stiffness and/or resilience, with strip-associated paper fibres oriented and allotted a capacity to be able to realign elastically somewhat after a crumpling up for the formation of a "ball"-structure.

Furthermore, it is taught that the thickness, the flexural stiffness and/or the resilience of the paper strip and co-ordinated plastic strip are/is adapted to be able to support pieces of firewood, resting against said "ball"-structure.

Moreover, the invention presents that the thin plastic strip should be able to consist of an environmental-friendly, high-energy, plastic material, forming carbon dioxide and water during a combustion at a free access of air.

In addition to this, it is taught that the material content in and the structure of the paper strip co-ordinated with the plastic strip are mutually adapted to give a chosen balance between a structural- and stability-providing capacity and an energy- and power-releasing capacity generated during combustion.

Furthermore, it is taught or suggested that the paper strip and/or the plastic strip should be able to have an edge configuration adapted for providing an embodiment that gives a tendency to and the possibility of a rapid lighting up.

Furthermore, it is taught that a multistage effect allotted to the combustion should be adapted to be attained by the fact that a more highly flammable layer or a part is brought to catch fire initially, and that the same in turn is adapted to allowing to light a second layer or part, adapted to subsequently being burnt at a higher temperature.

The invention teaches or suggests the utilisation of additional substances adapted for a selected energy release, directly adapted to a current field of application.

Furthermore, the invention teaches that the two or more co-ordinated paper strips and/or plastic strips of the lighting strip should be so tightly wound up to a roll and so compactly kept that they can resist a lighting by a fire coming from outside.

Furthermore, the invention teaches that a number of said lighting strips formed to a compact helical shape should be able to be co-ordinated in a dispenser construction as individual units.

Furthermore, it is taught that a number of such units very well may be co-ordinated to one and the same package.

Between the paper strip and the plastic strip of the lighting strip, a material serving as "desiccant" is inserted.

Furthermore, it is taught and suggested that said compact helical shape of the lighting strip should be surrounded by plastic, cardboard or paper, for the formation of a unit.

In this connection, it is taught and suggested that the unit should have a central hole, from which one end portion of the lighting strip is extractable.

The invention also teaches and suggests that the compact helical shape should, by an additional forming, be allotted a shape bordering on a quadratic outer shape.

Furthermore, it is taught and suggested that the inner end portion or pole of the lighting strip should be formed as and/or have a tab grippable by a hand, which tab is arranged to extend outside the compact helical shape.

More particularly, it is taught that the lighting strips are constructed from a co-ordinated paper strip and a plastic strip and that the strips are allotted the same or substantially the same thickness.

The invention also teaches and suggests the possibility of allowing a lighting strip and a set of matches and a striking surface to be packaged as a unit, alternatively of allowing the lighting strip and a lighter to be packaged as a unit.

ADVANTAGES

The advantages that foremost may be regarded to be associated with an inflammable, single-service material assembly is that, in this way, conditions have been created for the material assembly, in a position intended for storing, to be allotted the form of a roll, structured with compact turns and forming a helical shape, that the lighting strip in a simple way should be able to be removed from the same compact helical shape and crumpled up to a "ball"-structure and where the same "ball" will serve as support to an inflammable material resting thereon.

Thanks to the lighting strip consisting of one or more thin paper strips and of one or more thin plastic strips, conditions are created in order to increase the content of energy and the generation of power in relation to paper matter alone.

Furthermore, the lighting strips may be produced from a surplus material, brought from a manufacturing industry of such products that utilises a thin paper material and a thin plastic material.

What foremost can be regarded as characteristic features of an inflammable, single-service material assembly, in the form of a lighting strip, is defined in the characterizing clause of the subsequent claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS

A presently proposed embodiment of an inflammable, single-service material assembly, in the form of a lighting strip will now be illustrated and described more closely, reference being made to the accompanying drawing, wherein:

Figure 1 shows a lighting strip in a position intended for storing and allotted the form of a roll, with the turns helical-shapedly co-ordinated,

Figure 2 shows a first example of how a material layer of a lighting strip or the strip is unwound from the compact helical shape thereof, according to figure 1, while,

Figure 3 shows a second application of how lighting strips may be unwound,

Figure 4 shows three different embodiment examples, designated "A", "B" and "C", of the construction of the lighting strip, by means of one or more thin paper strips and one or more thin plastic strips,

Figure 5 shows how an extracted and unwound lighting strip, according to figures 2 and 3, have been crumpled up to a "ball"-structure or -shape,

Figure 6 shows how the "ball"-structure, according to figure 5, has been placed under pieces of firewood formed from wood material and have been compacted somewhat by one or more pieces of firewood,

Figure 7 shows a first embodiment of a package, having a roll according to Figure 1 and a unit of matches and a striking surface,

Figure 8 shows a unit, corresponding to Figure 7, with a lighter having been placed in the roll, and

Figure 9 shows an embodiment with an extra long lighting strip being packaged in a box and extractable from a centrally oriented hole in a carton.

DESCRIPTION OF PRESENTLY PROPOSED EMBODIMENT

It should then by way of introduction be emphasized that in the subsequent description of a presently proposed embodiment, which has the significative features associated with the invention and which is elucidated by the figures shown in the appended drawings, we have chosen terms and a particular terminology with the intention to thereby primarily allow to make evident the inventive idea.

It should, however, in this connection be taken into consideration that expressions chosen here should not be seen as limiting solely to the terms utilised and chosen here, but it should be understood that each term chosen in this manner should be interpreted so that it, in addition, comprises all technical equivalents that operate in the same or substantially the same way, in order to, in this way, enable the achievement of the same or substantially the same intention and/or technical effect.

Thus, with a reference to Figure 1, in a "compacted" state, there is shown an inflammable, single-service material assembly 1, in the form of a lighting strip 10 and that in a non-compacted state, according to Figure 6, should be able to present, after an initial lighting, an initial combustion with a generated amount of energy adapted to a subsequent secondary combustion of the lighting strip 10, in order to provide a lighting therefrom of an adjoining inflammable material, such as pieces of firewood 6, formed from wood, charcoal and/or briquettes.

Figure 1 further illustrates that the outermost turn 10a of the lighting strip 10 is glued on for stabilizing the unit 1.

Figure 1 further illustrates that one of the innermost end portions 11 of the lighting strip 10 is allotted the form of a tab 12 and which tab 12 can be held by a hand (not shown), while the lighting strip 10 formed to a roll can fall downward according to Figure 2.

Figure 3 illustrates how the lighting strip 10 formed to a roll is held while the tab 12 is allowed to fall downward, and in that way the lighting strip 10 is unwound successively from the roll.

Hence, in a non-compacted state, the lighting strip 10 according to Figure 1 and particularly according to Figures 2 and 3, and when it has been co-ordina-

ted to a "ball"-structure 9 according to Figure 5, is adapted to be able to present, after a lighting of the tab 12, an initial combustion with a generated amount of energy adapted for a primary initial lighting and a subsequent secondary combustion of the lighting strip 10, in order to, in that way, provide a lighting of an adjoining inflammable material, which in Figure 6 has been illustrated as pieces of firewood formed from wood, allotted the reference designation 6, 6a, 6b.

With a reference to Figure 4, there is illustrated the lighting strip 10, and the same lighting strip is in Figure 4A structured as and constituting of a thin paper strip 10' and a thin plastic strip 10" having straight edges 10b and 10c.

In an unwound and non-compacted state, the lighting strip 10 is, according to Figure 5, co-ordinated with the appurtenant strips thereof 10', 10" in such a way that a rapid lighting and a combustion of the paper strip 10' and the plastic strip 10" will take place.

The paper strip 10' may be composed of a thin material corresponding to the thickness of writing paper while the plastic strip 10" is composed of polyethylene (PE).

Via opposite surfaces, the thin paper strip 10´ and said plastic strip 10" are completely or partly united to each other, where Figure 4A illustrates a centrally oriented adhesive run or strip 10d.

In Figure 4B, the utilisation of two edge-oriented adhesive runs or strips 10e, 10f is illustrated, with a first paper strip 10' co-operating with a first plastic strip 10", a second paper strip (10') co-operating with a second plastic strip (10"), and thereby it is illustrated that the lighting strip 10 in a simple way can be constructed from an equal number or a different number of layers of co-ordinated paper strips and plastic strips, with one or more being allotted point-shaped edges (10b), (10c).

The lighting strip 10 is partly processed in such a way so that thereby, in a non-compacted state of the lighting strip 10, according to Figure 5, the possibility for air to pass and in that way get access to a developed seat of fire is presented, for a combustion-enhancing supply of oxygen, which also is illustrated in Figure 6.

To said thin paper strip 10' and to said thin plastic strip 10", one or more of energy-raising and/or combustion-improving and/or smoke-generating additional substances 8, 8a, such as powder, paste or liquid are supplied.

Said additional substances 8, 8a are fixed inside a formed gap between said thin paper strip 10' and said thin plastic strip 10" according to Figure 4B, by the fact that adjoining and opposite strip-allotted edges are provided with one or more seals 10e, 10f.

Accordingly, said seals are longitudinally oriented for the formation of a tunnel or a tube of utilised paper strip 10' and utilised plastic strip (10"), alternatively longitudinally 10e, 10f and transversally 10g, 10h oriented seals for the formation of closed pockets 8, 8a and with a perforating rule 10j oriented between two seals 10g, 10h co-ordinated close to each other.

More particularly, it is taught and suggested that said paper strip 10' should be allotted an adapted thickness, flexural stiffness and/or resilience, with strip-associated paper fibres oriented and allotted a capacity to be able to realign elastically somewhat after a crumpling up for the formation of a "ball"-structure 9 according to Figure 5.

More particularly, the thickness, the flexural stiffness and/or the resilience of the paper strip 10' and the thickness, the flexural stiffness and/or the resilience of a co-ordinated plastic strip should be adapted to be able to support pieces of firewood 6, 6a, 6b resting against said "ball"-structure 9, which is illustrated in Figure 6.

The plastic strip 10" consists of an environmental-friendly, high-energy, plastic material, forming carbon dioxide and water during a combustion at a free access of air.

More particularly, the material content in and the structure of the paper strip 10' co-ordinated with the plastic strip 10" should be mutually adapted to give a chosen balance between a structural- and stability-providing capacity and an energy- and power-releasing capacity generated during combustion.

More particularly, further there is shown that the paper strip 10' and/or the plastic strip 10" have/has an edge configuration 1k and 1m, respectively, with the same edge configuration being adapted for providing an embodiment that gives a tendency to and the possibility of a rapid lighting up.

Here, the edge configuration is illustrated, as well as in Figure 1, as point-shaped short sections (10b) (10c).

It is evident that the form of the same short sections 1k, 1m very well may be allotted other shapes than the one shown in Figures 4A, 4B and 4C, where Figure 4C furthermore shows recesses 10k and 10m.

As an alternative, it is taught and suggested that a multistage effect allotted to the combustion should be adapted to be attained by the fact that a more highly flammable layer or a part, such as the tab 12, is brought to catch fire initially, and that the same in turn is adapted to allowing to light a second adjoining layer 12a or part, oriented next to the tab 12, adapted to subsequently being burnt at a higher temperature.

In view of the possibilities of adaptation presented by the invention, a utilised additional substance may be adapted in terms of range and/or magnitude, and/or weight for a selected energy release, and thereby be able to be directly adapted to a current field of application.

More particularly, two or more co-ordinated paper strips 10', (10') and/or plastic strips 10", (10") of the lighting strip are so tightly wound up to a roll and so compactly contained to a unit that it can resist a lighting by a fire coming from outside.

A number of said lighting strips 10 formed to a compact helical shape 1 should be able to be co-ordinated in a dispenser construction as individual units, and in that way a number of such units can be co-ordinated to one and the same package, shown in Figures 7, 8 and 9.

As additional substance between the paper strip and the plastic strip of the lighting strip, a material serving as "desiccant" may be contained.

Said compact helical shape of the lighting strip 10, according to Figure 1, may be surrounded by plastic, cardboard or paper, for the formation of a unit.

By an additional forming, the compact helical shape, according to Figure 1, is allotted a shape bordering on a quadratic outer shape, illustrated in Figures 7 and 8.

Also here, the inner end portion or pole of the lighting strip 1 should be formed as and/or have a tab 12 or gripping edge grippable by a hand, which tab or edge is arranged to extend outside the compact helical shape (not shown).

More particularly, the lighting strip 10 is constructed from a co-ordinated paper strip and a plastic strip and that the strips are allotted the same or substantially the same thickness.

Reference being made to Figure 7, where it is shown that the lighting strip 10 and a set of matches 71 and a striking surface 72 are packaged as a unit 70, while Figure 8 illustrates that the lighting strip 10 and a gas lighter 81 are packaged as a unit 80.

Furthermore, it is seen from Figure 9 that a long lighting strip or a number of lighting strips 10 encasing units 90 should be able to show a central hole 91, from which one end portion 12 of the lighting strip and the lighting strip 12a, 10 as to the rest are extractable.

The lighting strips 10 are intended for a use in heating stoves, tiled stoves, wood stoves, single-house boilers, for outdoor use upon lighting of fires, camp fires, outdoor grills, etc., and composed in such a way so as to be able to give a high and steady temperature rapidly at controlled combustion of the material that is used as fuel, e.g., wood, and so that the seat of fire in the shortest feasible time reaches such temperature that an almost complete combustion is attained, which from an environmental point of view is desirable.

More particularly, the present invention relates to a lighting strip 10 consisting of a combination of different materials of paper, plastic or the like as thin strip forms that completely or partly are united to each other, wherein the strips partly may be processed in such a way that they present the largest possibility for air to pass and in that way get access to the seat of fire for combustion-enhancing supply of oxygen.

Due to the resilience of the paper member 10', the paper fibres and thereby the paper tend to realign also after crumpling up, which enables the formation of a "ball"-structure 9 or a "globe", which, when it is put in under the wood pieces 6, 6a, 6b, expands and reaches up under and against above-lying or adjacent wood, charcoal and/or briquettes.

Technical seen, the materials in the lighting strip 10 have been selected and composed so that they are included in a multistage system in an optimal way, aiming at the fastest feasible flashover, combustion and transfer of the heat energy to nearest layer. Practically, the system works so that a more highly flam-

mable part 12 of a strip composed in a particular way, preferably the outer part thereof, first is lit and after which it preheats an adjacent somewhat thicker and/or more energy- (heat-) releasing layer 12a, which, when it catches fire, in turn may release even more energy to the next adjacent layer 12b. The same may consist of, for instance, a material being extraordinarily inflammable at a higher temperature, and thereby highly energy releasing.

In one embodiment (Figure 4C), the lighting strip forms a continuous line of bags having perforation between each, every second or between a suitable number of bags; which makes the strip simple to tear off.

The bags may contain a high-energy powder, granulate, paste or a liquid. By the fact that the bags contain a certain quantity of said substances, the strip can be metered (measured) in, e.g., running metres or number of bags, and a good control can be kept on the effect of supplied quantity of heat/energy, which is of importance since the need changes with regard to the combustion appliance being used (e.g., single-house boilers, heating stoves, tiled stoves, fireplaces, etc.) or upon lighting up of outdoor fires, etc., and also the properties, the quality and the dryness of the fuel being used.

From above, it is seen that here it is about a system the content of energy of which is predetermined by the composition of the included components, and in that way a relatively accurate metering is enabled, by a tearing off of a suitable number of running metres or bags in view of present need.

Practical tests have indicated that it is, by experience, relatively easy to find out and determine certain standard lengths of the strips at the different needs that have been stated above.

By the fact that the technical structure of the lighting strips 10 in their relation to the seat of fire is logical and easy to understand, for the user it is inviting to follow given recommendations that explain the basic idea in the above-described technique.

Upon quick-start of fires, the present invention particularly teaches and suggests that the known technique is supplemented or is replaced with a material in the form of strips consisting of two or more layers, which are given such a dimension and shape that an optimal state is attained after lighting, involving that

the flames from the lighting strips are as close as possible to the wood for rapid, efficient heat transfer to the wood surfaces.

This is achieved by the fact that the stiff component among layers gives the material in the crumpled up "ball"-structure 9 strength to raise due to the tendency thereof to recover the original shape thereof.

The high-energy component, e.g., polyethylene (PE), substantially lacks resilience or stiffness and would thereby, on one hand, lack the possibility of reaching up to the vicinity of the wood surfaces 6, 6a, 6b by itself, and on the other hand melt down to a drip or lump, and would in that way lose the capacity of a rapid combustion as a consequence of the air does not having the possibility of reaching an area large enough. Thanks to the covering or putting up of the plastic 10" on a stiffer substance, such as for instance paper, a desired exposure to the air flow as well as to the radiant heat from the surroundings being multiplied.

Furthermore, the stiff material 10', which here preferably is intended to consist of paper, has to be completely dry upon the lighting. It is in the dry state the paper fibres are most stiff and in that way can keep the shape thereof, and also partly recover it after crumpling up 9. It is a known fact that a paper that has been lying down for a long time and dry gets an increased stiffness. Owing to an efficient, tight and moisture-protective dispenser, the same property of the paper may be maintained.

In one embodiment, the dispenser may also be manufactured from polyethylene, which is an environmental-friendly, watertight as well as moisture-proof material. In order to guarantee the tightness of the dispenser, the same is made as a bag (the material of the bag is extruded as a tube and lacks joints), and after loading of the contents, it is welded in both ends, which gives a good tightness.

The opening device 91, which has been accounted for above in connection with Figure 9, aims at guaranteeing that the package during storage and distribution is hermetically closed, up to the opening. The object in the construction is the same as for a drug package, on which particular requirements are made.

As has been stated above, the lighting strips 10', 10" are composed of one or more layers or strips, and are of such a nature that the same retain a porous structure and configuration also after compression or crumpling up 9. In that way,

the air (oxygen) can pass easier and contribute to a faster and more intense combustion process.

That is, the lighting strip 10', 10" is constructed from a stiffer material, e.g., paper, which is combined with other environmental-friendly, high-energy, high-temperature generating substances such as, e.g., plastic. By the same composition, a firmer matrix is obtained, which due to the stiffness thereof prevents the material from collapsing completely upon compression. Instead, after crumpling up 9, the material assumes the ideal form of a loose "clue" or a "ball"-structure 9 that permits the air to pass straight through, whereby the warm air from the just lit portion of the "ball"-structure becomes lit. The material combination is so adapted that the combustion occurs rapidly but optimally, so that surrounding wood or other inflammable substances have the time to absorb the heat from the flames and the hot air, so that they are preheated in order to catch fire rapidly.

From the instant when a match (or a lighter) initiates the fire, it takes normally approx. 10–20 seconds until the "ball"-structure 9 is completely in flames. The strong heat makes that surrounding fuel 6, 6a, 6b catches fire rapidly and burns properly, so that larger pieces of wood may be put on and a hot fire is attained in considerably shorter time than by conventional methods.

Thanks to a high temperature being attained in the seat, the entire fire will more rapidly attain the optimal temperature that is required for a more complete combustion, and thereby the emissions of uncombusted hydrocarbons and other harmful gases will decrease.

The materials used in the above-described material combinations are relatively inexpensive, since they consist of commonly occurring qualities of paper, plastic coated paper and/or film of polyethylene, which all readily may be cut to slender strips in thickness and width that presents the best yield.

In one embodiment producing a good result, paper of a thickness of 60 g/m^2 is used, coated with a PE-thickness of 15 g/m^2, which has been sealed against a PE-film of 60 g/m^2, the strip width (tape width) being approx. 25 mm as for the plastic coated paper and approx. 20 mm as for the PE-film, respectively.

An advantage of this type of lighting means is that it is delivered compact on a single, slender roll or reeled on a wider roll. The paper produces little ash upon combustion at the high temperatures presented by the PE-layer.

That is, the lighting strips can be stored in a dry state. The mechanical protection of the dispenser is so formed that the strip 10 not only is easily accessible and in desired length, but also so that the opening 91 of the dispenser 90 is re-closable and tight between each time of use. In case particularly heavy requirements are made on high flammability, inside the dispenser a small bag containing silica gel (desiccant) or the like that absorbs moisture is enclosed, in case a leakage in the dispenser has occurred. The powder, granulate, paste or liquid additives between the different material layers mentioned elsewhere, may be adapted to increase the flammability further.

The advantage may also be taken into consideration that, as the contents of the dispenser decrease, it may be pressed together and is in that way occupying less space, since the contents thereof are deformable. This is of importance in camping, expeditions, etc., when there is little space available. The proper dispenser is also completely made from inflammable and environmental-friendly material.

As of the tightness, a double security has been arranged by the fact that two cardboard surfaces, which have been placed against each other and which in that way surround the hole to the interior of the bag, are provided with an outer heat-sealed zone, which guarantees unopened package. It is upon the initial opening this guarantee seal is broken (not re-sealable). But then also the inner zone having stick glue has to be broken, and the same is re-sealable. The same device increases the security to keep the contents dry.

Thanks to the lighting material being dispensed in the form of a strip, it is easy to learn how much that is needed under different conditions. In the case of dry and split wood in smaller pieces, it takes approx. 5 running metres, while in the case of larger pieces of wood and wet wood 20–25 running metres may be needed. Household rolls 90 contain approx. 500 running metres, while camping packages accommodate approx. 150 running metres and the single-service container accommodates approx. 15 running metres.

The toothed edge of "the bib" allows exact and simple tearing off of the lighting strip 10. This is of importance since the re-closing of "the bib", which should close tightly across the strip and the hole, can be made easier.

For various packages, advantages may be given in particular in respect of the purpose they are intended for:

The portion pack of lighting strip

The same is intended for a single service, as auxiliary equipment, always accessible in emergencies. In the same package, there is a lighting strip 10 of approx. 15 m in the form of a roll. Optionally, a desiccant bag is contained. The contents are encased in a tight plastic bag, provided with a tear initiation, of such a nature that the bag is easy to open.

Portion pack of lighting strip, some matches and a striking surface according to Figure 7

The same contents as above but also having approx. 3–6 matches 71 and striking surface 72, encased in a sleeve, placed in an oval centre of the somewhat flattened roll.

Portion pack of lighting strip and a lighter according to Figure 8

The same as above but provided with a lighter 81, encased like the matches above by a sleeve manufactured from in principle the same material as the lighting strip, for mechanical protection of the lighter 81.

The camping package

Intended for use in hiking tours, mountain tours, etc. It contains lighting strip of approx. 150 running metres, which is enough for approx. 10 lightings. The surrounding dispenser that is tight has a practical opening device that allows tight re-closing. In the case of special requirements, a bag of "desiccant" may be enclosed in the dispenser.

The household package according to Figure 9

The same is intended for starting up of tiled stoves, heating stoves, wood boilers, outdoor fires etc. It contains approx. 500–1000 running metres (different sizes) of lighting strips 10, and will thereby normally last out approx. 50–100 lightings. In one embodiment, the dispenser 90 has the shape of a cube manufactu-

red from corrugating board having a side of 19 cm, the hole 91 having been placed on the top side so that it is simple to pull out the strip 10 to a desired length. A hooded flap 92 may encase the projecting strip end and simultaneously block the hole 91. A circle of stick glue 93 placed all around the hole 91 makes it possible to make the flap tighten the hole 91 hermetically, so that upon long-time storage, the contents can be contained dry.

Storing of all packages

In all packages, the lighting strips 10 are relatively firmly rolled in order to occupy the smallest possible space. The greatest possible energy can then be contained within the smallest possible space. This also presents the advantage that a rapid combustion (fire) cannot arise as the air cannot reach into the same firmly wound, compact rolls 1. If storing of larger quantities of roll packages has to be made at one and the same place, therefore the risk of fire and explosion is small. Neither is any spontaneous combustion plausible as the flash point is high. Comparison with liquid fuels is then unfavourable to the same, since the risk of lighting due to the lower flash point thereof is considerably greater.

The invention is of course not limited to the embodiment given above as example, but may be subjected to modifications within the scope of the general idea according to the invention, illustrated in the subsequent claims.

Particularly, it should be taken into consideration that each unit and /or category shown may be combined with each other unit and/or category shown within the scope in order to be able to attain the desired technical function.